

### **REMARKS**

The Office Action indicated that the subject matter of Claims 10, 11, 13, 16 and 17, which are dependent upon the original Claim 1, would be allowed if rewritten in independent form. Applicant requests that the allowance of these claims be held in abeyance in order to consider an amendment to the present claims and the following comments.

As noted in our specification on Page 2, Paragraph 7, there has been an outstanding requirement to provide a comprehensive measurement of very small particulate matter, e.g., 2.5  $\mu\text{m}$  particles suspended in ambient air. Problems, however, have occurred in the use of particular types of conventional filtering tapes and filters which have had a thick thickness of approximately 450  $\mu\text{m}$  and a weight of 7  $\text{mg}/\text{cm}^2$  as average values when glass fiber is used. Problems have also occurred with a partial absorption of beta rays when the tape is formed from a glass fiber.

The present invention provides a capacity of improving a collecting member of filter tape while, as noted on Page 9, Paragraph 31, of our specification, permitting such a tape to be used in conventional measuring apparatus without requiring significant alteration to such structures. As disclosed further in our specification on Page 16, Paragraphs 72-74, it has been found that a lamination of a particular thin porous film with a reinforcing layer has permitted an improvement in the performance of collecting such small particulate material.

The present invention further addresses the required tensile strength by providing a balance between a reinforcing layer and the weight and thinness of the porous film. The porous film is arranged at a lower portion of a filter tape while the reinforcing layer is arranged at the upper portion. See Paragraphs 90-92 of our present specification that notes an improvement in reducing beta ray absorption to increase the sensitivity of the measurement.

As can be appreciated, the monitoring of ambient small particles in the atmosphere has been of considerable concern for over 40 years, and numerous different attempts have been made to collect accurate data in this field. As such, numerous engineers, scientists and technicians have tried to provide improvements in a highly competitive and crowded field of endeavor. The merits of the present invention should be weighed in this environment.

The Office Action rejected Claims 1, 2 and 4-9 over a combination of the *Wedding* (U.S. Patent No. 5,317,930) in view of a Millipore Membrane Filter data sheet.

The *Wedding* reference is directed to a particular type of a flow rate control apparatus that could accommodate a wide variety of filter media while still maintaining a constant and theoretically predictable sample flow rate. See Column 3, Lines 19-23. The *Wedding* patent noted in particular that at the time of its invention, no air samplers were available that could collect particulate matter of less than 10  $\mu\text{m}$  in size using a variety of different filter substrates.

The *Wedding* reference noted a desire to maintain a constant volumetric airflow rate regardless of the particular filter that was to be utilized. To accomplish this purpose, measurements were made of the changes in pressure drop across the filter in order to maintain a constant volumetric flow rate, and an expandable and contractible bellows with an appropriate spring constant was used to both sense the changes in air pressure drop across the filter and the changes in stagnation pressure downstream of the filter. As a result, a variation in the effective flow area of an orifice could be achieved as a result of such changes in air pressure to maintain constant volumetric flow rate of the air. Thus, even if a filter became clogged, purportedly the flow control apparatus could maintain a constant volumetric flow. See Column 8, Lines 4-16.

The Office Action acknowledged that the *Wedding* reference did not teach a reinforcing layer on one side of the tape, but contended that someone having access to the Millipore

datasheet would permit a person of ordinary skill in the art to replicate a fluorine resin membrane filter with a polyethylene support. Applicant respectfully traverses this position. This assertion of a teaching in this field cannot be found in either the *Wedding* or the Millipore datasheet references.

Claims 12, 14 and 15 were further rejected over the *Wedding* and Millipore references when taken in view of the *Barringer* (U.S. Patent No. 4,192,176). The *Barringer* reference is directed to geochemical exploration, including the capacity to drag a sampling tube with a perforated sleeve behind a helicopter to collect relatively giant particles that may be able to be related to the geochemistry of the underlying soil. As noted on Column 3, the particulate material that is sucked up through the collecting tube and sleeve includes particles in the range of 400 to 600 microns, and a cyclone separator attempts to remove smaller particles through the use of a conical mesh sieve inside the cyclone device. The coarse particles are the desired ones for an analysis, and they are subsequently treated and collected.

As can be appreciated, the *Barringer* reference is not concerned with, nor does it find it desirable to measure ambient minute particulate material as measured in our present invention. Needless to say, there is no equivalent filter tape used having the particular properties and characteristics set forth in our claims. It would appear that the *Barringer* reference was cited merely in hindsight to disclose the capacity of using either an impact or a cyclone separator in measuring particles only greater than 50 microns in size.

Finally, Claim 3 was rejected over a combination of *Wedding*, *Millipore* and the *Johnson et al.* (U.S. Patent No. 4,866,277). The *Johnson et al.* reference disclosed a conveyor apparatus for receiving used protective clothing garments from workers to determine the existence of radioactive material that may be attached to the worker's clothing and other garments such as

“duck feet” worn over the shoes of maintenance personnel. In measuring the radiation from such garments, *Johnson et al.* simply suggests a lead shield to remove background radiation.

The *Johnson et al.* reference is certainly not directed to measuring minute particles by a radiation source of beta rays wherein the amount of collected particles in the air will affect the absorption of the beta rays to measure the amount of particles. Rather, *Johnson et al.* is concerned with radioactive material that may be accidentally placed on clothing and accurately measuring whether the clothing is contaminated. Again, there does not appear to be a teaching reference that would suggest this combination.

The case of *In re Oetiker*, C.A.F.C., 977 F.2d 1443, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992) would appear to be pertinent to this form of rejection.

In order to rely on a reference as a basis for rejection of the applicant's invention, , the reference must either be in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. \* \* \* Patent examination is necessarily conducted by hindsight, with complete knowledge of the applicant's invention, and the courts have recognized the subjective aspects of determining whether an inventor would reasonably be motivated to go to the field in which the examiner found the reference, in order to solve the problem confronting the inventor. We have reminded ourselves and the PTO that it is necessary to consider “the reality of the circumstances” \* \* \* – in other words, common sense – in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.

Hypothetically accepting for argumentative purposes this combination of cited references would still fail to teach a filter tape with a porous film for trapping the particulate material with a reinforcing layer of a non-woven fabric that allows the transmission of sample gas. As can be appreciated, the present filter structure is a compromise wherein it recognizes that simply using a fluorine resin material of a desired thinness will not have the strength necessary to serve its

purpose. However, by simply increasing a thickness of the fluorine material or by adding a reinforcing layer, the issue of the absorption of the beta ray will become a more serious problem. Thus, the present invention is a compromise to increase measurement sensitivity in this field.

Additionally, the gas must be easily passed through the combination filter tape without undue pressure loss. The present invention uses a reinforcing layer of a non-woven fabric as set forth in our specification to address these issues. A non-woven fabric provides a property of reinforcing the fluorine porous tape while still insuring an easy passage of gas with a relatively low-pressure loss. Additionally, the density of the overall filter tape can be maintained small to prevent unnecessary absorption of beta rays. This improves the sensitivity of measurement.

The issue of static electricity that can occur with a fluorine resin tape is also addressed by reinforcement with the non-woven fabric since the total amount of fluorine resin material can be reduced. None of the references of record recognize these features nor propose a solution as now set forth in our present claims.

The dependent Claims 26-28 define other features of both the porous film and filter tape that are not shown nor suggested in the references of record. Finally, newly drafted independent Claim 29 is supported by the characteristics of not only the reinforcing layer, but the drastic reduction in weight of the filter tape.

In view of the above comments and the amendments to the claim, it is believed that the case is now in condition for allowance, and an early notification of the same is requested.

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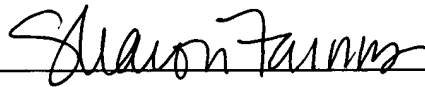
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If the Examiner believes that a telephone interview will help further prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed phone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on October 22, 2004.

By: Sharon Farnus



Signature

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Very truly yours,

**SNELL & WILMER L.L.P.**



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